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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/925,985	09/09/97	PATRICK R	^{mk} P0318/LAM1P0

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IM62/0323

EXAMINER

MARKOFF, A

ART UNIT	PAPER NUMBER
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1746

18

DATE MAILED: 03/23/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

08/925,985

Applicant(s)

PATRICK ET AL.

Examiner

Alexander Markoff

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10 and 25-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10 and 25-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 3/2/01 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 08925,985 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 2, 4-10, and 25-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite because the terms "pure metallic material" and "substantially pure metallic material" are relative terms lacking proper comparative basis.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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5. Claims 1, 2, 7, 25, and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Hills et al (US Patent NO 5,685,914).

Hills et al teach (entire reference) improving the etch uniformity of a plasma process by the use of a ring (124). See at least Fig. 3 and the related description. The ring has a surface, which is even and parallel with the surface of the substrate (110). The ring surrounds the substrate. The ring is made of the aluminum (column 5, lines 60-66).

The plasma cloud is inside and outside of a ring 114 (see for example Fig.1) and thereby extends beyond an outer periphery of the ring 124.

6. Claims 1, 2, 4-10, 25, 26, 27, 28-31 and 33 rejected under 35 U.S.C. 102(e) as being anticipated by Ye et al (US Patent NO 5,891,348).

Ye et al teach a method as claimed. See the entire reference, especially Figs. 2, 3a, and 3b and the related description.

The method utilizes a substrate holder made from aluminum and having all claimed limitations. The reference recites the claimed etching process and the claimed etching gases.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102((e), f) or (g) prior art under 35 U.S.C. 103(a).

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hills et al (US Patent NO 5,685,914).

Hills et al teach (entire reference) improving the etch uniformity of a plasma process by the use of a ring (124). See at least Fig. 3 and the related description. The ring has a surface, which is even and parallel with the surface of the substrate (110). The ring surrounds the substrate. The ring is made of the aluminum(column 5, lines 60-66).

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The plasma cloud is inside and outside of a ring 114 (see for example Fig.1) and thereby extends beyond an outer periphery of the ring 124.

Hills et al do not specifically teach that the ring 124 contacts the substrate. It is not clear if any space is presented between the ring and the substrate.

Hills et al, however, teach that the ring 114, can cause of the trapping of contamination near the substrate periphery (column 1, lines 65-67).

Accordingly, it would have been obvious to an ordinary artisan at the time the invention was made to make the ring 124 which has the inner periphery complimentary to the outer periphery of the substrate in order to eliminate any space where the contamination can be trapped.

11. Claims 4-6, 8-10 26-30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hills et al (US Patent NO 5,685,914) in view of Abraham(US Patent NO 5,772,906) and Abraham et al (US Patent NO 5,952,244).

Hills et al teach (entire reference) improving the etch uniformity of a plasma process by the use of a ring (124). See at least Fig. 3 and the related description. The ring has a surface, which is even and parallel with the surface of the substrate (110). The ring surrounds the substrate. The ring is made of the aluminum (column 5, lines 60-66).

The plasma cloud is inside and outside of a ring 114 (see for example Fig.1) and thereby extends beyond an outer periphery of the ring 124.

Hills et al do not recite the specifically claimed type of the plasma apparatus.

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However, they do not limit their method to the use of any specific type of the apparatus or any type of the plasma process.

Abraham and Abraham et al teach that the claimed chambers (TCP TM of Lam Research Corporation) and processes (aluminum etching using chlorine) were conventional in the art.

It would have been obvious to an ordinary artisan at the time the invention was made to expend the teaching of Hills et al to any conventional plasma etching process (including the aluminum etching processes recited by Abraham and Abraham et al) with reasonable expectation of adequate results in order to improve the uniformity of the etching.

12. Claim 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al (US Patent No 5,891,348).

Ye et al teach, as it is shown above the claimed method except for helium cooling.

Because the reference is directed to a problem of uniformity of the process, not to conventional details of the plasma apparatus, it is not clear from the description whether or not the helium cooling is used.

However, it is the examiner's position that helium cooling is conventionally utilized in the plasma methods. Thereby it would have been obvious to an ordinary artisan at the time the invention was made to use helium cooling in the method of Ye et al for it's primary purpose with reasonable expectation of adequate results.

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13. The following rejections are alternative rejections to the rejections made above over Hills et al alone and in combinations with other references. In these rejections the teachings of six US Patents have been used to show that both aluminum and anodized aluminum are conventionally used to make the inside components of the plasma apparatuses.

14. Claims 1, 2, 7, 25, 31 and 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hills et al (US Patent NO 5,685,914) in view of any one of Shamouilian et al, Kao et al, Zhao et al, Bhan et al, Rossman et al and Ye et al.

Hills et al teach (entire reference) improving the etch uniformity of a plasma process by the use of a ring (124). See at least Fig. 3 and the related description. The ring has a surface, which is even and parallel with the surface of the substrate (110). The ring surrounds the substrate. The ring is made of the aluminum (column 5, lines 60-66).

The plasma cloud is inside and outside of a ring 114 (see for example Fig.1) and thereby extends beyond an outer periphery of the ring 124.

Hills et al teach the use of the ring made of an anodized aluminum.

However, it was well-known and conventional in the art to make the parts of the plasma apparatuses from either aluminum or anodized aluminum. See Shamouilian et al, Kao et al, Zhao et al, Bhan et al, Rossman et al and Ye et al as an evidence. All these references recite aluminum and anodized aluminum as alternative materials for the internal parts of the plasma apparatuses.

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It would have been obvious to an ordinary artisan at the time the invention was made to substitute one conventionally used material for another one conventionally used for the same purpose with reasonable expectation of adequate results.

Thereby it would have been obvious to an ordinary artisan at the time the invention was made to use aluminum ring in the method of Hill et al with reasonable expectation of adequate results in order to increase a selection of available materials.

Hills et al do not specifically teach that the ring 124 contacts the substrate. It is not clear if any space is presented between the ring and the substrate.

Hills et al, however, teach that the ring 114, can cause of the trapping of contamination near the substrate periphery (column 1, lines 65-67).

Accordingly, it would have been obvious to an ordinary artisan at the time the invention was made to make the ring 124 which has the inner periphery complimentary to the outer periphery of the substrate in order to eliminate any space where the contamination can be trapped.

15. Claims 4-6, 8-10 26-30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hills et al (US Patent NO 5,685,914) in view of any one of Shamouilian et al, Kao et al, Zhao et al, Bhan et al, Rossman et al and Ye et al as applied above further in view of Abraham(US Patent NO 5,772,906) and Abraham et al (US Patent NO 5,952,244).

Hills et al do not recite the specifically claimed type of the plasma apparatus.

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However, they do not limit their method to the use of any specific type of the apparatus or any type of the plasma process.

Abraham and Abraham et al teach that the claimed chambers (TCP TM of Lam Research Corporation) and processes (aluminum etching using chlorine) were conventional in the art.

It would have been obvious to an ordinary artisan at the time the invention was made to expend the modified teaching of Hills et al to any conventional plasma etching process (including the aluminum etching processes recited by Abraham and Abraham et al) with reasonable expectation of adequate results in order to improve the uniformity of the etching.

Response to Amendment

16. The Declaration of Mr. Patrick under 37 CFR 1.132 filed 3/2/01 is insufficient to overcome the rejection of claims based upon Hill et al as set forth in the last Office action because: The Declaration merely states that the anodized aluminum is difficult to etch. This statement does not contradict with the examiner's position that the anodized aluminum is capable to be etched, as required by the claims.

It is noted that the Declaration does not make a clear statement that anodized aluminum is not "capable of being etched" by plasma.

It is also noted that the Declaration is not commensurate in scope with the claims. The claims are not limited to the sacrificial portion being aluminum. The claims recite "pure metallic material", "material comprising pure aluminum", "substantially pure

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metallic ... surface", "material comprising 99,999% pure aluminum", etc. All these terms are either indefinite or use term "comprising" which is an "open" term.

Response to Arguments

1. Applicant's arguments filed 3/2/01 have been fully considered but they are not persuasive.

The Applicants state that the terms "pure metallic material" and substantially pure metallic material" are definite, but fail to provide any reasoning to support their statement. The examiner remains in the position that the rejection is proper.

The Applicants argue that the rejection made under 35 USC 102 is not proper because the Examiner did not specifically pointed out the place in the patent where etching of the ring (124) is recited.

This is not persuasive because the steps of the method of Hills et al and the claimed method are the same, it is inherent that the results of this steps would be the same and that the ring would be etched by the plasma at least at some degree.

The Applicants argue that Hills et al teach the use of anodized aluminum and thereby the claims are not anticipated because the anodized aluminum would have a combination of oxygen and aluminum.

This is not persuasive because the claims use relative terms such as "pure", "substantially pure" or use the term "consist essentially of aluminum". None of these terms exclude the use of anodized aluminum. Moreover, the Applicants attention is

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directed to the fact that any aluminum (even "pure" aluminum) would be covered by a layer of a natural oxide.

The Applicants argue that ring 124 is not one of the parts recited by Hills et al in the part reciting the use of aluminum.

This is not persuasive because at least at some embodiments (Fig.3, Fig. 8) they are the same.

The Applicants argue that claims 9 and 30 recite the use of 99,999% aluminum.

It is noted that the claims only require the material to comprise 99,999% aluminum.

It is again noted that the claims are not limited to the sacrificial portion or it's surface being a metal or being aluminum or being 99,999% aluminum. The claims recite "pure metallic material", "substantially pure metallic material", "pure metallic material comprising aluminum", "substantially pure metallic surface", "consist essentially of aluminum", "pure metallic material comprises 99,999% pure aluminum". All these terms have more broad meanings than the meaning used by the Applicants in their Remarks.

In this Office action the examiner in addition and alternative to the previous rejections provided the rejection in which the teaching of the several of US patents was used to show that both aluminum and anodized aluminum were conventional and alternative materials for the internal parts of the plasma apparatuses.

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The Applicants attention is also brought to Ye et al, which is used to reject most of the pending claims under 35 USC 102 and other claims under 35 USC 103. The teaching of this reference anticipates the pending claims by reciting the use of aluminum parts as claimed, in the claimed processes, for the claimed purpose.

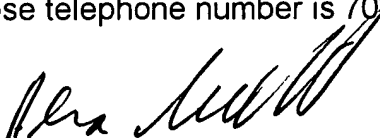
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 703-308-7545. The examiner can normally be reached on Monday - Friday 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on 703-308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7719 for regular communications and 703-305-7718 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.

**ALEXANDER MARKOFF
PRIMARY EXAMINER**


Alexander Markoff
Primary Examiner
Art Unit 1746

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March 21, 2001